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ABSTRACT

Two methods of scheduling reinforcement, differential reinforcement of other behaviors (DRO) and differential reinforcement of low rates of responding (DRL), were investigated in two experiments that demonstrated each procedure's effectiveness in reducing misbehavior when used by teachers in school settings. A third experiment was undertaken to ascertain which procedure is more beneficial to educators in terms of implementation, effectiveness in reducing misbehavior, and acceptance by students. There were three subjects, aged 5, 7 and 10 (one for each experiment). Results demonstrated the effectiveness of both DRO and DRL schedules in the reduction of misbehavior. (Author/MS)

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Misbehavior in the Classroom: A Comparison of Two Reinforcement-based Behavior-reducing Procedures (DRO and DRL)[1]

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Misbehavior is demonstrated to be an educational problem of increasing importance that teachers must be able to deal successfully with. Two methods of scheduling reinforcement, differential reinforcement of other behaviors (DRO) and the differential reinforcement of low rates of responding (DRL), are investigated in two experiments that show each procedure's effectiveness in reducing behavior when used by teachers in school settings. A comparison of the two techniques is conducted in the third experiment that attempts to ascertain which procedure is most beneficial to educators in terms of ease of implementing, effectiveness in decreasing misbehavior and acceptance by students.

Managing the classroom and classroom discipline has always been, and currently is, a chronic problem for educators. Teachers have never been adequately trained to deal with discipline problems as they occur or to prevent the occurrence of the problem. Clarizio (1976) suggests that teachers must learn how to manage their classes since approximately 10% of all students enrolled in public schools evidence behavioral problems that warrant clinical attention. "Although it is true that schools refer more youngsters than any other agency to professionally trained workers, it is equally evident that the teacher, nonetheless, remains the person who has the primary responsibility for the classroom management of the disturbed child" (p.2).

Phillips and Wiener (1972) also believe that discipline is important to classroom situations since, in their opinion, a teacher cannot teach effectively unless he or she has the student's interest and attention. They conclude that, "without good discipline, the schoolroom is a waste of people's time. No wonder the teacher who has to spend most of his time on behavior problems cannot teach the youngster what he should learn. No wonder the teacher is worn out from daily tugs-of-war--back and forth, forth and back--between himself and the students" (p.4).

Historically, schools have always been associated with a certain level of violence and vandalism, but the incidences have been relatively sporadic and minor. In 1964, school teachers felt that only about 3% of their students could be classified

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as discipline problems (U.S. Senate Subcommittee's Report on Juvenile Delinquency, 1975). Compare this to a recent poll by Gallup reported in The Atlanta Journal/ Constitution (1975). In the poll, lack of discipline was named as the foremost problem presently facing our schools and has been for six of the preceding seven years (1968-1975).

There are problems in our schools which have not been previously present, at least at their current levels. Children are behaving differently; rules and home environments are different.

> We are becoming aware that the attitudes of today's children, regardless of age, are quite different from what they were in the "good old days". Children no longer accept parents' judgments as absolute. Indeed, in many cases they pay little or no attention to them at all. Parents are called upon to justify their actions in ways which were not expected of them in the past. In addition, defiance and even outright rebellion are becoming more characteristic of even very small children (Dreikurs and Grey, 1968, p.4).

Open and structured classrooms suffer the effects of misbehavior as do upper and lower class schools. Both black and white, ghetto and non-ghetto children misbehave. Punishment in the school is frowned upon and is often illegal. Teachers and administrators, school boards and parents are frustrated. Misbehavior has become an important educational problem.

Two behavior-reducing procedures developed by behavior analysts are the differential reinforcement of other behaviors (DRO) and the differential reinforcement of low rates of behavior (DRL). Since both DRO and DRL use positive reinforcement to reduce or eliminate misbehavior, possible problems that aversive procedures may produce are avoided.

DRO is a schedule that reinforces the absence of a behavior for a specified period of time. The procedure has been used effectively with normal preschoolers (Goetz, Holmberg and LeBlanc, 1975; Zeiler, 1970) and with special populations in both school and institutional settings (Corte, Wolf and Locke, 1971; Repp and Deitz, 1974; Repp, Deitz and Speir, 1974; Meyers, 1975).

DRL provides reinforcement when the frequency of the behavior is at or below a specified level for a period of time. DRL has been used with special populations (Deitz and Repp, 1974) and with normal children in school settings (Barrish, Saunders and Wolf, 1969; Deitz and Repp, 1973; Harris and Sherman, 1973; Deitz and Repp, 1974). Deitz (1977) has identified three methods of programming DRL schedules: spaced responding, full session and interval.

In spaced-responding, the targeted response is reinforced if a minimum amount of time has elapsed since the previous targeted response has occurred. Full session DRL provides for reinforcement if the total number of responses during a session is at or below a specified level (the DRL limit). In interval DRL, the session is divided into equal time segments. If the DRL limit (which is the same for all intervals) for the time period is not exceeded, reinforcement is provided at the end of the interval. If the targeted response exceeds the limit during an interval, the interval is reset and reinforcement is postponed.

This paper presents three experiments that used DRO and DRL schedules of reinforcement. The first two studies, using reversal designs, investigated the applicability and effectiveness of DRO and DRL used by teachers in school settings. The last study used a reversal design to compare the two procedures.

Experiment I

Method

The subject (S-1) for this study was a seven-year-old male enrolled in a second grade class of a Fulton County (Atlanta, Georgia) public school. The subject was selected by his teacher because she felt that his "talk-outs" were interferring with his achievement in reading. "Talk-outs" were operationally defined as any unsolicited sound made by the subject during each day's 30-minute reading period, and were recorded by S-1's teacher. A total of 10 observer agreement checks (three in Phase I, two each in Phases II and III, and three in Phase IV) between the teacher and a second observer were made. Observer agreement (number of agreements divided by the total number of agreements plus disagreements X 100) ranged from 66% to 100% with a mean level of 90.1%.

An ABAB experimental design was used to investigate the functional relationship between S-1's talk-outs and a DRO schedule with a one-minute interval during reading group. For baseline, (Phase I), S-1's operant level of talk-outs was recorded for seven sessions. In Phase II, S-1 was informed that he would receive one minute of free time for every minute he did not talk-out during reading group (an ordinary kitchen timer was used to time each session). Whenever a talk-out did occur, the timer was reset and reinforcement was postponed. During Phase III, which lasted seven sessions, the conditions of baseline (Phase I) were reinstated. S-1 was informed that he would no longer receive free time. In Phase IV, treatment conditions were reinstated; S-1 was again informed that he could earn free time and he was again informed of the contingencies he would be under. This phase lasted seven sessions.

Results

Insert figure 1 about here.

Figure 1 shows the number of recorded talk-outs emitted during each session across the four phases of the experiment. During baseline conditions, the mean-level of responding was 20.6. When treatment began, talk-outs decreased to a mean-level of 4.8 per session. In Phase III, when the DRO contingency was removed, talk-outs increased to a mean-level of 11.0. When treatment was reinstated, the frequency of talk-outs decreased to a mean of 5.6.

Experiment II

Method

The subject of this experiment, S-2, was a five year-old-male, enrolled in a kindergarten class in the Atlanta, Georgia public school system. S-2 was chosen by his teacher because, in her words, "when playing games or working with and/or around other children, he constantly fights".

An ABAB experimental design was employed. During Phase I (baseline), each time S-2 engaged in "fighting", the teacher recorded a talley mark on a sheet of paper and told S-2 to stop stop fighting. For purposes of observation, fights were operationally defined as bodily contact with another classmate and included behaviors such as hitting, kicking and shoving. Baseline conditions lasted 10 sessions (each session equaled the 3-hour period the student was at the school). At the beginning of treatment conditions (Phase II), S-2 was informed that each day his behavior showed an improvement over what it had been during baseline, he would be given a note to take home that explained his behavior for that day. The DRL-limit during this period was six (eg., if S-2 engaged in 6 or fewer fights over the course of the day, he would be given a note to take home explaining how well he had worked in class that day). S-2 was not given a note to take home on days when his fighting exceeded the DRL-limit of six. Phase II lasted nine sessions. During the eight sessions of Phase III (return to baseline), the full session DRL contingency was withdrawn and S-2 was told he could no longer earn notes to take home. With the reinstitution of treatment (Phase IV), S-2 was again informed that he could earn notes. Phase IV lasted ten sessions. During the four phases of the experiment, a total of five observer-agreement checks were made with another teacher serving as the second observer. The mean-level of observer agreement was 98% and ranged from 90% to 100%.

Results

Insert figure 2 about here.

Figure 2 shows the total number of fights recorded by the teacher for each session recorded across the four phases of this experiment. During baseline conditions, the mean-level of fights per session was 12.3. When the DRL contingency was initiated, the number of fights fell to a mean-level of 4.5 per session. In Phase III, when the treatment conditions were removed, the mean-level of fights rose to 8.4. For the final phase of the experiment (Phase IV), when treatment conditions were reinstated, the number of fights fell to an average of 3.8 per session.

Experiment III

Method

The subject of this experiment was a ten-year-old male enrolled in a fifth grade class at a Fulton County, Georgia, public school. S-3 was selected by his teacher because he frequently talked-out and interrupted others during class discussions. The teacher felt S-2's verbal disruptions were adversely effecting his achievement and the general tone of the class.

An ABAC research design was used to compare the relative effectiveness of DRO versus interval DRL, with both schedules using three-minute intervals. Phase I lasted twenty-five sessions (all sessions were 30-minutes in duration), each time S-3 "talked-out" during the discussion group, the teacher recorded a talley mark on an observation sheet. As in Experiment I, "talk-outs" were defined as any unsolicited verbal noise made by the subject. Before Phase II began (DRO-three-minute interval), S-3 was told that for every three-minute interval that passed in which he did not talk-out, he would receive one point. Points could be accumulated and exchanged for various objects, events and/or activities. A list that described the various reinforcers and their "cost" was also given to S-3. In the DRO phase (Phase II), which lasted eleven sessions, a kitchen timer was used to time each interval. If S-3 emitted a talk-out during the three-minute interval, the timer was reset to three-minutes and reinforcement was delayed. In Phase III (an eleven-session return to baseline), S-3 was informed that he could no longer earn points. Instead of reinstating the DRO treatment conditions in Phase IV, interval DRL was substituted. During this five session phase, S-3 was allowed to emit one or less talk-out during each three-minute interval (eg., at the end of each interval, S-3 earned a point that he could exchange if he had talked-out one or no times). If S-3 talked-out a second time during an interval, the timer was reset and reinforcement was postponed. Observer agreement was checked a total of eleven time during the experiment. Agreement ranged from 28% to 100% with a mean average of 80.1% across all phases.

Results

Insert figure 3 about here.

Figure 3 shows the recorded number of talk-outs per session for all phases of the experiment. During Phase I, the mean-level of talk-outs was 8.12 times per session. During the DRO-3-minute treatment condition, the mean-level of responding fell to 1.5 talk-outs per session. In Phase III (return to baseline), talk-outs rose to a mean average of 4.5 per session. In the final phase of the experiment (DRL-3-minute intervals), the mean-level of talk-outs per session was 3.4.

Discussion

The three studies reported in this paper empirically demonstrate the effectiveness of both the DRO and DRL schedules or reinforcement in the reduction of misbehavior. Teachers involved in the studies rated both procedures as equal in their ease of application. All of the teachers initially expressed their beliefs that (a) too much of their effort would be required to implement the procedures properly, and (b) that the procedures might interfere with their classroom routines. However, after becoming familiar with the procedures, the teachers found that they were not expending any more of their time dealing with the misbehavers than they were before they implemented the procedures. Second, they were finally experiencing a reward for their efforts: the reduction of misbehavior in their classes without having to use aversive techniques. Finally, the classroom routines were not greatly affected by the use of the procedures. Initially, the kitchen timer's bell was a disrupting influence, but the students quickly adapted to this novel stimulus.

DRO, in the comparison study (experiment 3), appeared to be slightly superior to interval DRL with this particular subject. Still, the teachers and Ss rated DRL as the more favorable procedure. Reasons cited for this preference included: (a) DRO may produce "superstitious" behaviors since the behavior the student is doing at the end of an interval will be reinforced; and (b) DRL allows one to emit some target responses and still earn reinforcement. The latter point is especially important when dealing with small children, since their behavior is often classified as inappropriate merely because it occurs at too high a rate. For example, few, if any, educators would want to completely eliminate "talk-outs" in children, because there are situations in which this behavior is desirable. In a circumstance where the target behavior is appropriate at times, a reinforcement schedult that allows some behavior to occur (DRL) would be preferable to a schedule that may completely extinguish the behavior (such as DRO).

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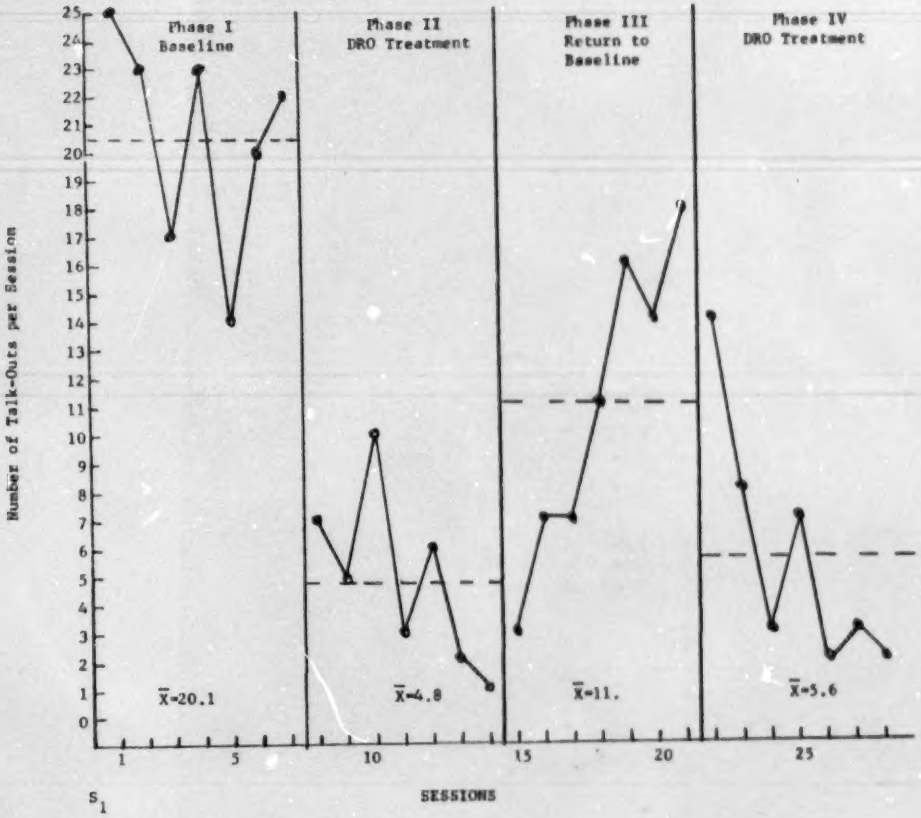
Phase I
Baseline
Phase II
DRO Treatment
Phase III
Return to
Baseline
Phase IV
DRO Treatment
Number of Talk-Outs per Session
$\bar{X}$=20.1
$\bar{X}$=4.8
$\bar{X}$=11.
$\bar{X}$=5.6
SESSIONS
S_1

Figure 1

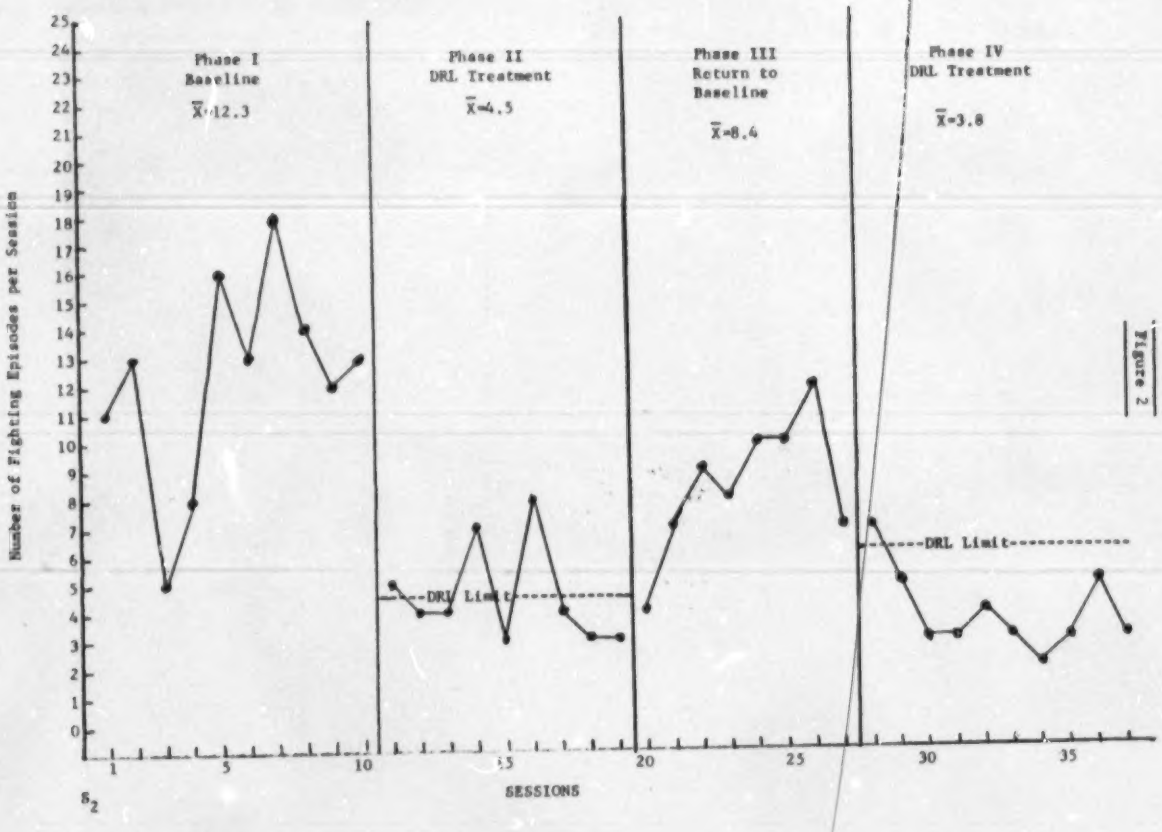
Phase I
Baseline
$\bar{X}$=12.3
Phase II
DRL Treatment
$\bar{X}$=4.5
Phase III
Return to
Baseline
$\bar{X}$=8.4
Phase IV
DRL Treatment
$\bar{X}$=3.8
DRL Limit
DRL Limit
Number of Fighting Episodes per Session
SESSIONS
S_2

Figure 2

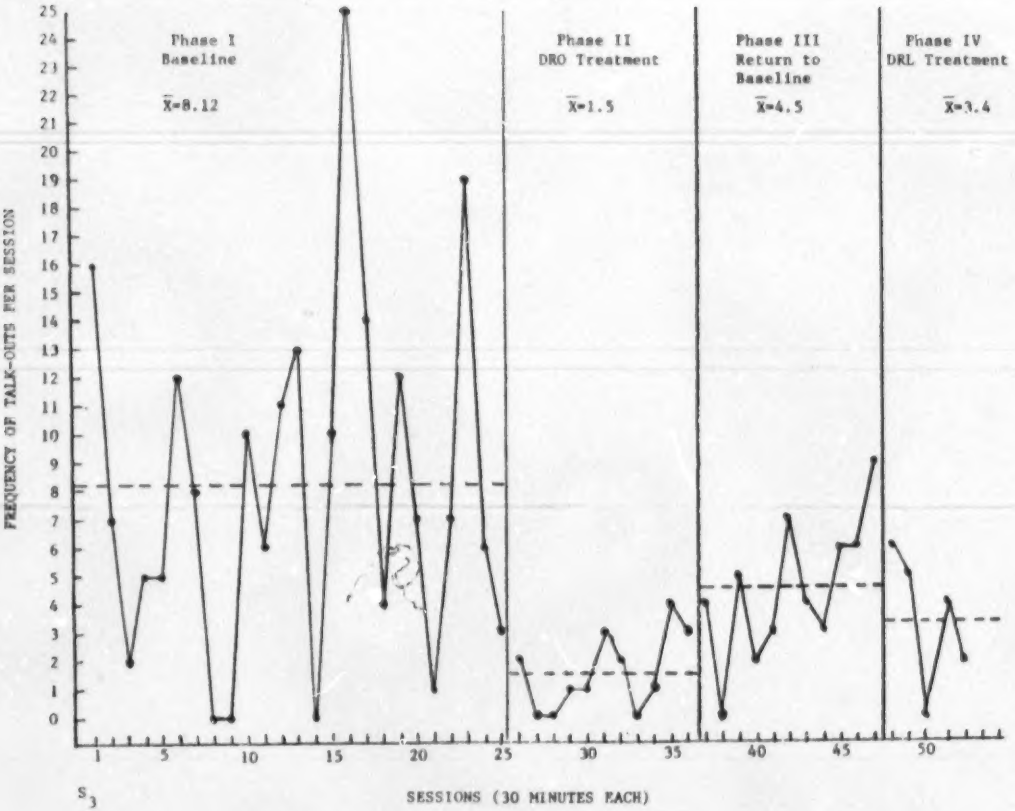
Phase I
Baseline
X̄=8.12
Phase II
DRO Treatment
X̄=1.5
Phase III
Return to
Baseline
X̄=4.5
Phase IV
DRL Treatment
X̄=3.4
FREQUENCY OF TALK-OUTS PER SESSION
SESSIONS (30 MINUTES EACH)
S3

Figure 3